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(54) Method and apparatus for sending and receiving data, such as digital audio data

(57) A sending/receiving method for data, such as musical data, in which plural data stored in a first storage unit are retrieved based on the request information sent from a host side device. The retrieved data is sent to a terminal side device. The sent data is checked to see as to whether or not the sent data is data newly stored in the first storage unit. If the results of check indicate that the sent data is data newly stored in the first storage unit, the sent data is stored in a second storage unit of the terminal side device.

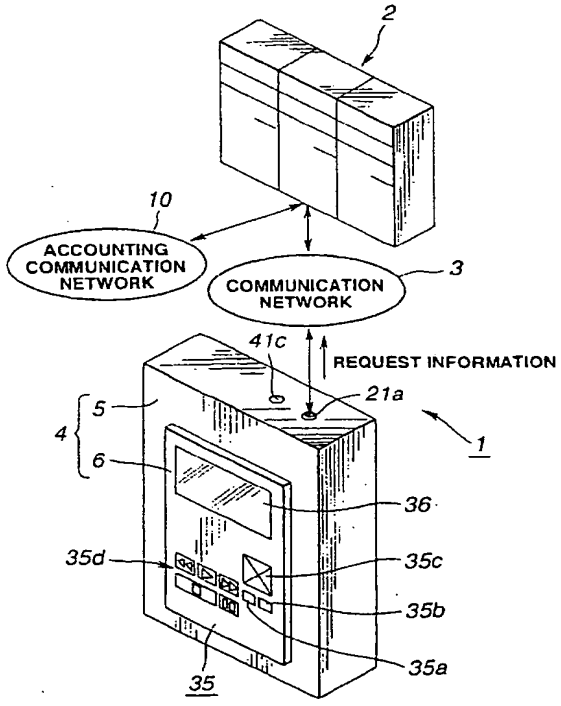

FIG.1

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Description

[0001] This invention relates to a data sending/receiving method and apparatus, a data receiving apparatus and a data sending apparatus. More particularly, it relates to a data sending/receiving method and apparatus configured for sending and receiving data, a data receiving apparatus and a data sending apparatus.

[0002] With improvement in the technique of compressing video signals or speech signals or in the digital signal processing technique in the field of broadcasting or communication, it has become possible to realize services of distributing digital data, such as video on demand (VOD) or music on demand (MOD).

[0003] Up to now, as an example of service configurations of furnishing digital data, a so-called push type service is being offered, in which the receiving side specifies a particular genre to the host side over the Internet and in which the host side retrieves data falling under the genre from a data base to sequentially transfer the retrieved data in succession to the receiving side.

[0004] However, in the conventional data transmission/reception system, there lacks up to now a system of automatically downloading data of the new information, put on sale or publicized only of late, on the reception side. For example, in the conventional MOD system, there lacks a system of downloading data on new musical numbers on the reception side. In the conventional MOD system, there lacks a system for permitting the reception side to switch between the low quality reproduction and the high quality reproduction of data on new musical numbers. In addition, the conventional MOD system is no other than a system in which a user pays fee unexceptionally for data acquisition. On the contrary, there has not been known to data a system in which a portion of a new musical number is heard on trial and a user pays only the fee for the number which has suited to his or her liking in order to acquire the data for the new musical number in its entirety.

[0005] It is therefore an object of the present invention to provide a data sending/receiving apparatus which resolves the above-described problems.

[0006] It is another object of the present invention to provide a data sending/receiving method which resolves the above-described problems.

[0007] It is still another object of the present invention to provide a data reception apparatus which resolves the above-described problems.

[0008] It is yet another object of the present invention to provide a data sending apparatus which resolves the above-described problems.

[0009] According to the present invention there is provided a data sending/receiving apparatus including a first storage unit holding plural data on memory, a retrieval unit for retrieving the data stored in the first storage unit, a first sending/receiving unit for sending data retrieved by the retrieval unit, and a second sending/receiving unit for receiving the data sent from the first sending/receiving unit and for sending the request information from the user. The first sending/receiving unit receives the request information sent from a user to supply the received request information to the retrieval unit. The second sending/receiving unit has a decision unit for checking whether or not data sent from the first sending/receiving unit is data newly stored in the first storage unit and a second storage unit for storing data sent from the first sending/receiving unit if the results of check by the check unit indicates that the data is data stored in the first storage unit.

[0010] According to the present invention there is also provided a data receiving apparatus including a sending/receiving unit for receiving data sent from a host side device and for sending the request information from the user to the host side device, a storage unit for storing received data sent by the sending/receiving unit and a controller for checking whether or not the sent data is data newly stored in the host side device, the controller causing the sent data to be stored in the storage unit if the results of check indicate that the sent data is data newly stored in the host side device.

[0011] According to the present invention there is also provided a data sending/receiving method including the steps of retrieving plural data stored in a first storage unit based on the request information from a user sent to a host side device, sending the retrieved data to a terminal side device, checking whether or not the sent data is data newly stored in the first storage unit and storing the sent data in a second storage unit of the terminal side device if the results of discrimination indicate that the sent data is data newly stored in the first storage unit.

[0012] According to the present invention there is additionally provided a data sending apparatus including a storage unit having plural data stored therein, a retrieval unit for retrieving data stored in the storage unit based on the request information from the user containing data specifying the user's intention to make payments sent from a terminal side device and a sending/receiving unit for sending the data retrieved by the retrieval unit. The sending/receiving unit also receives the request information sent from the user to send the received information to the retrieval unit. The sending/receiving unit switches the sending mode to the terminal side device of data retrieved by the retrieval unit based on data specifying the user's intention to make payments for the request information from the user.

[0013] The invention will be further described by way of example with reference to the accompanying drawings, in which:-

Fig.1 shows an entire structure of a data sending/receiving system embodying the present invention.

Fig.2 is a perspective view for illustrating the loading of a portable terminal device on a data relaying device.

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Fig.3 is a block diagram showing an illustrative circuit structure of a data sending/receiving system.

Fig.4 shows an example of a format of data sent from a data sending apparatus to a data receiving apparatus.

Fig.5 is a flowchart for illustrating the processing by a data sending apparatus, a data relaying device and a portable terminal device in case the designation of new musical number data is contained in the data designation information of the request information sent from the portable terminal device to the data sending apparatus and for illustrating an example of switching the sound quality of the new musical number data transferred by the data sending apparatus to the data receiving apparatus.

Fig.6 is a flowchart for illustrating the processing contents of the data sending apparatus, data relaying apparatus and the portable terminal device in case the data sending apparatus executes a push type service.

Fig.7 is a diagrammatic view showing an example of setting an accounting flag for the musical data stored in a hard disc of a hard disc drive.

Fig.8 is a perspective view for illustrating the case of reproducing new musical number data recorded on the hard disc in the portable terminal device.

Fig. 9 is a flow chart illustrating the playback processing for new musical number data.

Fig.10 is a perspective view for illustrating the portable terminal device accessing the data sending apparatus without employing the data relaying device.

Fig.11 is a perspective view showing an alternative structure of the data relaying apparatus.

[0014] Referring to the drawings, preferred embodiments of a data sending/receiving apparatus according to the present invention will be explained in detail.

[0015] In the data sending/receiving apparatus, explained in the following embodiment, it is assumed that music data is sent from a data sending apparatus as a host side device to a data receiving apparatus as a terminal side device.

[0016] A data sending/receiving system 1 of the present invention, shown n Fig.1, is a system for so-called music-on-demand and a data sending device 2 as a terminal device on the server side is connected over a communication network 3 to a data receiving device 4. The data receiving device 4 is made up of a data relaying device 5 and a portable terminal device 6, as a user side terminal device, detachably connected to the data relaying device 5.

[0017] Specifically, each lateral surface of a casing of the portable terminal device 6 is loaded on a mounting portion 7 formed as a recess in a casing of the data relaying device 5 for electrically and mechanically interconnecting the data relaying device 5 and the portable terminal device 6. That is, with the data sending/receiving system 1, the data sending device 2 is connected over the communication network 3 to the data relaying device 5, and the data relaying device 5 is connected to the portable terminal device 6 for interconnecting the data sending device 2 and the portable terminal device 6.

[0018] The data sending device 2 is mounted at, for example, a data management centre on the side of the server and exchanges data concerning the accounting for performing preset accounting for the user. The data relaying device 5 relays the request information from the portable terminal device 6, as later explained, to send the relayed information to the data sending device 2, while relaying the data sent from the data sending device 2 to send the relayed data to the portable terminal device 6. The data relaying device 5 is mounted on kiosk shop at a railway station, a convenience store, a public telephone box or at a home. The portable terminal device 6 is owned by each user and is a portable device convenient for transportation.

[0019] Although only one data relaying device 5 and one portable terminal device 6 are shown in Fig.6 for convenience in illustration, a plurality of data relaying devices 5 and a plurality of portable terminal devices 6 are connected over the communication network 3 to the server side data sending device 2.

[0020] For the communication network 3 and an accounting communication network 10, ISDN or a telephone network is used. Although the present embodiment illustrates an embodiment in which the communication network 3 and the data sending device 2 are connected by wired connection, such as with a communication cable or an optical fibre, the wired connection may be replaced by radio or wireless connection. In addition, although the communication network 3 and the data relaying device 5 are similarly connected by wired connection, such as with a communication cable or an optical fibre, wireless connection, such as over a radio route, may also be used. Also, in the data sending/receiving system 1, data transmission from the data sending device 2 to the data receiving device 4 may be via a communication medium, employing a broadcasting satellite, without employing the communication network 3 by a wired connection. If the broadcasting satellite is used, the communication network 3 is used for sending the request information, as later explained, from the data receiving device 4 to the data sending device 2.

[0021] The server side data sending device 2 receives the request information, as later explained, sent from the data relaying device 5 over the communication network 3, to retrieve the relevant data based on the received request information. In addition, the data sending device

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2 transfers the retrieved data in a preset system over the communication network 3 to the data relaying device 5 and/or to the portable terminal device 6.

[0022] Referring to Fig.3, this data sending device 2 includes an interfacing unit 11 connected over the communication network 3 to the data relaying device 5 for data sending and reception, a large-capacity hard disc array 12, having plural data items, such as music numbers, stored therein, and a data retrieving processing unit 13 for retrieving relevant data from this hard disc array 12. The data sending device 2 also includes an accounting processing unit 14 for accessing the accounting communication network 10 to perform preset accounting for the chargeable user and a controller 15 for controlling the data sending device 2 in its entirety.

[0023] The interfacing unit 11 is connected over the communication network 3 to the data relaying device 5 to receive the request information sent from the portable terminal device 6, such as the data designation information or the user ID information. The interfacing unit 11 sends data, such as music data, outputted by the data retrieving processing unit 13, as later explained, via the communication network 3 to the data relaying device 5. The above-mentioned operations of the interfacing unit 11 are executed on the bases of the control signals sent from the controller 15.

[0024] In the hard disc array 12, there are stored data, such as musical data of various genres, guide for music, or other audio data as compressed data. In the hard disc array 12, there are stored musical data concerning the new musical numbers, referred to herein as new musical number data, along with an appended identifier, referred to herein as a new musical data identifier. The new musical number data means musical data within a preset time period as from the date on which it is put on sale only of late, such as within one month. The specified definition of the new musical number data is appropriately determined or modified on the host side.

[0025] The data retrieving processing unit 13 receives the request information from the portable terminal device 6, received by the interfacing unit 11, over the controller 15, and retrieves relevant data from the numerous data items, such as musical numbers, stored in the hard disc array 12, based on this request information. The data retrieving processing unit 13 has a memory for transient data storage and reads out the retrieved data from the hard disc array 12 for transient storage therein. The data retrieving processing unit 13 also sends the data stored in the memory to the interfacing unit 11.

[0026] The data retrieving processing unit 13 also can read out only new musical number data from the hard disc array 12 by retrieving the new musical number identifier. The above-described operation of the data retrieving processing unit 13 is performed on the basis of control signals from the controller 15.

[0027] The accounting processing unit 14 receives the request information from the portable terminal device 6, received by the interfacing unit 11, via the controller 15, and specifies the chargeable users based on the received request information, while executing preset accounting for the chargeable user.

[0028] The controller 15 has a sending control program for sending musical data relevant to the received request information to the data relaying device 5 on the basis of the request information sent from the portable terminal device 6 via the data relaying device 5 and the communication network 3. The controller 15 controls the interfacing unit 11, hard disc array 12, data retrieving processing unit 13 and the accounting processing unit 14 based on this sending control program.

[0029] Specifically, the controller 15 controls the interfacing unit 11 so that the request information sent from the portable terminal device 6 via the data relaying device 5 and the communication network 3 is received and sent to the controller 15. The controller 15 transiently stores the request information supplied form the interfacing unit 11 to send this request information to the data retrieving processing unit 13 and to the accounting processing unit 14.

[0030] The controller 15 executes the above-described retrieval based on the data designation information of the received request information to read out the retrieved data from the hard disc array 12 to store the data transiently in the memory of the data retrieving processing unit 13.

[0031] The controller 15 refers to the user ID information of the received request information to control the data retrieving processing unit 13 and the interfacing unit 11 so that the data transiently stored in the memory of the data retrieving processing unit 13 is sent to the interfacing unit 11 and data read out from the memory is sent to the data relaying device 5 to which is connected the portable terminal device 6. In this manner, musical data is sent from the data sending device 2 to the portable terminal device 6 in the present data sending/receiving system 1.

[0032] In the sending control program of the controller 15 is assembled a program for offering a so-called push type service as its subroutine. The program for offering this push type service includes a genre-based sending program for sequentially sending musical data in the relevant genre to the portable terminal device 6 based on the genre designating information used for designating the specified genre sent from the portable terminal device 6.

[0033] In the program for offering the push type services, there is assembled the new musical number data sending program for sequentially sending only the new musical number data to the portable terminal device 6 based on the new musical number request information from the portable terminal device 6 commanding transfer only of new musical number data. The control operations performed by the controller 15 in offering these push type services will be explained in detail subsequently.

[0034] The data sending/receiving system 1 of the

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present embodiment uses the packet exchanging system and sends data on the data packet basis. The format of each data packet sent from the data sending device 2 to the data receiving device 4 is such a format in which music data as main data portion is compressed with modified DCT as disclosed for example in Japanese Laying-Open Patent H-3-139923 or Japanese Laying-Open Patent H-3-139922 and in which a new music number flag or number ID is appended to the compressed data, as shown in Fig.4.

[0035] The new musical number flag is a flag specifying whether or not the music data as compressed data is the new musical number, and is appended as a header for each data packet. The number ID data includes, for example, music genre, name of the performing artist or the title of the musical number. By using the data format as shown in Fig.4, there is caused no inconvenience in the data sending/receiving system 1 even in case the data is sent from the data sending device 2 to the data receiving device 4 over the broadcasting satellite or data is sent in accordance with the push system.

[0036] Referring to Fig.3, the data relaying device 5 includes an interfacing unit 21, a hard disc array (HDD) 22, a read-only memory (ROM) 23, a random-access memory (RAM) 24, an operating input unit 25, a display unit 26, an interfacing (I/F) unit 27, a charging unit 28 and a controller 29 comprised of a micro-computer. These elements are interconnected over a bus 30.

[0037] The interfacing unit 21 is connected via communication network 3 to the data sending device 2 to receive data sent from the data sending device 2. The received data is stored transiently in the RAM 24. In the data relaying device 5, a terminal 21a provided on the top of a casing serves as input/output terminals of the interfacing unit 21 serves as an input/output terminal of the interfacing unit 21.

[0038] The hard disc drive 22 includes a hard disc, not shown, on which received data transiently stored in the RAM 24 is recorded under control by the controller 29.

[0039] In the ROM 23 is stored the relay control program for controlling the operation of the data relaying device 5. In the data relaying device 5, the controller 29 reads out the relay control program stored in the ROM 23 to control the constituent elements of the data relaying device 5.

[0040] The RAM 24 transiently stores the data sent from the data sending device 2 over the communication network 3. The RAM 24 transiently stores the request information sent from the portable terminal device 6 over the I/F 27.

[0041] An actuating input unit 25 sends an actuation input signal to the controller 29 and has a plurality of actuating buttons 25a, as shown in Fig.2.

[0042] A display unit 26 has a liquid crystal display device and is provided on the top of the casing, as shown in Fig.2. This display unit 26 displays the actuating input signal from the actuating buttons 25a, data reception states from the data sending device 2 or the request information from the portable terminal device 6.

[0043] The I/F 27 is an input output interface for the portable terminal device 6 and is connected to the I/F 31 of the portable terminal device 6 to receive the request information from the portable terminal device 6 via this I/F 27. The I/F 27 sends musical data sent from the data sending device 2 via I/F 31 to the portable terminal device 6. The I/F 27 of the data relaying device 5 and the I/F 31 of the portable terminal device 6 provide for electrical connection between the data relaying device 5 and the portable terminal device 6 via terminal 27a on the side of the data relaying device 5 and via terminal 31a of the portable terminal device 6 connected to the I/F 27 and I/F 31, respectively, as shown in Figs.2 and 3.

[0044] The charging unit 28 is used for charging a battery 39 of the portable terminal device 6. Specifically, with the data relaying device 5 being electrically connected to the portable terminal device 6, that is with the portable terminal device 6 being loaded in position on the data relaying device 5, an output terminal 28a of the charging unit 28 is contacted with an input terminal 39a of the battery 39, as shown in Figs.2 and 3, to supply the current from the charging unit 28 to the battery 39 under control by the controller 29.

[0045] The controller 29 reads out and executes the relay control program stored in the RAM 23 to control the respective blocks as described above.

[0046] Referring to Fig.3, the portable terminal device 6 includes an interface (I/F) 31, a hard disc drive (HDD) 32, a read-only memory (ROM) 33, a random access memory (RAM) 34, an actuating input unit 35, a display unit 36, an interface (I/F) 37, a data expanding unit 38, a battery 39, a D/A controller 41 and a controller 42 made up of a micro-computer. These component parts are interconnected over a bus 40.

[0047] The I/f 31 is an input/output interface for the data relaying device 5 and is connected to the I/F 27 of the data relaying device 5 in order to output the request information to the data relaying device 5. The I/F 31 receives data, such as music, from the data sending device 2, sent from the data relaying device 5 over the I/F 27. The received music data is transiently stored in the RAM 34.

[0048] The hard disc drive 32 includes a hard disc, not shown. The music data from the data sending device 2, transiently stored in the RAM 34, is recorded in this hard disc.

[0049] In the ROM 33 is stored the control program for controlling the operation of the portable terminal device 6. The controller 42 of the portable terminal device 6 reads out the control program stored in the ROM 33 to control the constituent elements of the portable terminal device 6.

[0050] The RAM 34 transiently stores data sent from the data relaying device 5 or the various data sent from the controller 42.

[0051] The actuating input unit 35 sends actuating input signals to the controller 42 and, as shown in Figs.1

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an 2, is provided with various actuating buttons 35a to 35d. Specifically, the actuating buttons 35a and 35b are selection keys for moving a cursor displayed on the display unit 36 or selecting various functions, while the actuating key 35c is a decision key for making decisions as to various functions. The actuating button 35d, made up of plural actuating keys, are made up of various actuating keys for executing basic operations, such as playback, stop, pause, cue or review, for reproducing data recorded on the hard disc of the hard disc array 32. In the portable terminal device 6, these actuating buttons are pushed to permit actuating input signals corresponding to the thrusting to be sent over the bus 40 to the controller 42.

[0052] The display unit 36 has a liquid crystal display device and is provided on the upper part of the major surface of the casing, as shown in Figs.1 and 2. This display unit 36 is responsive to an actuating input signal from the actuating input unit 25 derived from the pushing actuation of the actuating buttons 35a to 35d to display the request information generated by the controller 42, reception states from the data sending device 2 or the connection states with the data relaying device 5.

[0053] The I/F 37 is an input/output interface for an external input/output device, such as a keyboard, modem or display. The lower part on the lateral surface of the casing of the portable terminal device 6 is provided with a connection terminal 37a for interconnecting the I/F 37 with the external input/output device, as shown in Fig.2.

[0054] The data expanding unit 38 expands musical data, that is compressed data, read out from the RAM 34 or the hard disc drive 32.

[0055] The battery 39 furnishes the source voltage to the respective constituent elements of the portable terminal device 6 and may be a repeatedly rechargeable secondary cell, for example, a nickel cadmium cell, nickel hydrogen cell or lithium ion cell. In the present embodiment, the battery 39 is automatically charged by the voltage supplied from the charging unit 28 of the data relaying device 5 when the portable terminal device 6 is connected to the data relaying device 5.

[0056] The D/A controller 41 converts digital signals outputted by the data expanding unit 38 into analog playback signals. The playback signals generated after conversion by the D/A controller 41 are sent to the terminal 41a so as to be outputted as speech or as music via an external speaker 43 connected to the terminal 41a.

[0057] The controller 42 reads out the control program stored in the ROM 33 to execute the read-out program to output a control signal to respective blocks of the portable terminal device 6 to execute pre-set processing. Specifically, the controller 42 generates the request information based on the actuation input signals from the actuating input unit 35 to send the request information to the data relaying device 5 by way of a control operation. The controller 42 also outputs the data stored in the RAM 34 via data expanding unit 38 and D/A controller 41 to an external speaker 43 by way of a playback operation. The controller 42 furnishes the data stored in the RAM 34 to the hard disc drive 32 for storage in the hard discs held therein.

[0058] The request information sent by the portable terminal device 6 to the data sending device 2 may be exemplified by the user ID information, data designation information for specifying data desired to be acquired, and the accounting information specifying whether or not the user is intending to make corresponding payments. The user ID information is previously stored in the memory in the controller 42 in order to generate the user ID information automatically.

[0059] In order for the data sending device 2 to execute the above-mentioned genre-based sending program, it suffices if the genre designation information for specifying the genre of musical data desired to be acquired is sent to the data sending device 2 in place of the data designation information of the request information. In order for the data sending device 2 to execute the above-mentioned new musical number data sending program, it suffices if the new musical number information for requesting only the new musical number data to be transferred is sent to the data sending device 2 in place of the data designating information. At this time, the above-mentioned genre designation information may be sent simultaneously with the new musical number request information in order to acquire only new musical number data in the specified genre.

[0060] The basic operation in the respective devices when the user acquires music data in accordance with the so-called MOD system in the present data sending/receiving system 1 is hereinafter explained. The user acts on the actuating buttons 35a to 35d of the actuating input unit 35a of the portable terminal device 6 to designate one or more desired data. If new musical number data is contained in the specified data, the above-mentioned accounting information is entered to decide whether or not to make payments. The portable terminal device 6 then generates the request information including the accounting information by the controller 42. This request information is stored in the RAM 34.

[0061] For designating the data, it suffices if the schematics and a list of data registered in the hard disc array 12 of the data sending device 2 are stored as a data base menu in the ROM 33 or in the RAM 34 and desired data is selected from this data base menu by actuation of the actuating buttons 35a to 35d. At this time point, the portable terminal device 6 need not be connected to the data relaying device 5.

[0062] If the portable terminal device 6, in which the request information has been generated as described above, is loaded on the mounting portion 7 of the data relaying device 5, and the controller 29 of the data relaying device 5 detects that the portable terminal device 6 has been loaded in position, the controller 29 of the data relaying device 5 reads out the relay control pro-

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gram from the ROM 23 to execute the read-out program. This connects the portable terminal device 6 via data relaying device 5 and the communication network 3 to the data sending device 2. In the data sending/receiving system 1, the request information stored in the RAM 34 is sent from the I/F 31 to the data relaying device 5 under control by the controller 42. The data relaying device 5 which has received the request information from the portable terminal device 6 sends this request information via communication network 3 to the data sending device 2 under control by the controller 29.

[0063] In the data sending device 2, the request information sent from the device 5 is entered to the interfacing unit 11, the request information entering the interfacing unit 11 being then sent to the controller 15 and to the data retrieving processing unit 13. The data retrieving processing unit 13 refers to the data designation information of the request information to retrieve and read out the corresponding data from the hard disc array 12. The controller 15 controls the interfacing unit 11 to send the data read out from the hard disc array 12 via communication network 3 to the data relaying device 5 based on the request information. The music data read out from the hard disc array 12, that is the music data designated by the user, is received by the data relaying device 5. The controller 15 discriminates, based on the user ID information in the request information, whether or not the user of the portable terminal device 6 is the user who can use the data sending/receiving system 1, and permits only the user capable of using the data sending/receiving system 1 to perform the operations indicated in the flowcharts of Figs.5 ff.

[0064] The controller 29 of the data relaying device 5 which has received the data controls the respective blocks so that the received data will be sent to the portable terminal device 6. Specifically, the controller 29 sends data entering the modem 21 via I/F 27 to the portable terminal device 6, while causing the data to be stored on the hard disc of the hard disc drive 22. This permits the data to be backed-up by the hard disc drive 22 even if the data relaying device 5 is disconnected from the portable terminal device 6 during data sending.

[0065] The basic operation in the respective devices when the user acquires new musical number data in the data sending/receiving system 1 is explained with reference to the flowcharts.

[0066] Fig.5 shows that plural data is designated in the data designating information of the request information sent by the portable terminal device 6 to the data sending device 2. Specifically, Fig.5 is a flowchart showing processing contents of t the data sending device 2, data relaying device 5 and the portable terminal device 6 in case the designation of new musical number data is contained in this data designation information. That is, this flowchart shows a typical processing of switching the sending mode when the data sending device 2 sends data to the data receiving device 4 depending on the possible presence of accounting for the new musical number data.

[0067] The controller 15 of the data sending device 2 having received the request information refers to the data designation information of the request information at step sl to control the data retrieving processing unit 13 to retrieve and read out data designated by the user from the hard disc array 12.

[0068] At the next step S2, the controller 15 verifies whether or not data read out from the hard disc array 12 is the new musical number flag explained with reference to Fig.4, based on the new musical number data. If the result of check at step S2 is YES, that is if the data is the new musical number data, the flow moves to step S3. If the result is NO, that is if the data is found not to be the new musical number data, the flow moves to step S5.

[0069] At step S3, the controller 15 refers to the payment information of the request information to check whether or not the user is willing to make payments for the new musical number data. If the result of check at step S3 is YES, that is if it is found that the user is willing to make payments for the new musical number data, the flow moves to step S4. If the result of check at step S3 is NO, that is if it is found that the user is not willing to make payments for the new musical number data, the flow moves to step S6.

[0070] At step S4, the controller 15 controls the accounting processing unit 14 to execute preset accounting for the new musical number data before the flow moves to step S5.

[0071] At step S5, the controller 15 switches to the sending mode of sending the new musical number data or other musical data, for which accounting has been made, to the data receiving device 4 with the same sound quality, that is with high sound quality, and executes data processing matched to the mode, before proceeding to step S7. On the other hand, the controller 15 at step S5 switches to the sending mode of sending the new musical number data for which the user is not willing to make payments with a sound quality lower than that of other musical data, executes data processing matched to the mode, before proceeding to step S7. If new musical number data is sent at step S5 or S7, a new musical number flag is set in a header of each data packet before sending the data packet.

[0072] As for the processing at steps S5 and S6, the new musical number data or other data, read out from the hard disc array 12 is directly sent at step S5, while new musical number data is converted at the processing at step S6 to audio data which is sent directly or after limiting the S/N ratio or the frequency range of the new musical number data. It is also possible to send only new musical number data for one chorus without degrading the sound quality of the new musical number data.

[0073] By executing the processing at step S6, it is possible for the data sending device 2 to send new musical number data as sample data to the user failing or not willing to make payments.

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[0074] The data sent in this manner from the data sending device 2 is received by the data relaying device 5 at step S7 and sent to the portable terminal device 6 under control by the controller 29 of the data relaying device 5.

[0075] The portable terminal device 6 on reception of data from the data relaying device 5 at step S8 detects the new musical number flag of the header of each data packet shown in Fig.4 by the controller 42 to check at step S9 whether or not the data is the new musical number data. If the result of check at S9 is YES, that is if the data is found to be the new musical number data, the flow moves to step S10 and, if otherwise, the flow moves to step S11.

[0076] The controller 42 allows the new musical number data to be supplied to the hard disc drive 32 at step S10 to control the data to be stored in the hard disc in the hard disc drive 32.

[0077] The controller 42 performs control at the next step S11 to send the new musical number data or other data to the data expanding unit 38 to expand the data to sequentially reproduce the data. This permits the portable terminal device 6 to sequentially reproduce the data requested by the user and to record only the new musical number data automatically on the hard disc. On the portable terminal device 6, the new musical number data for which payment has been made can be heard with the same sound quality as that of other musical data, while the new musical number data for which payment has not been made can be heard as data processed at step S6, that is as so-called sample data.

[0078] Fig.6 is a flowchart showing the processing contents of the data sending device 2, data relaying device 5 and the portable terminal device 6 in case the data sending device 2 performs so-called push type services similar to broadcasting. In this flowchart, the portable terminal device 6 designates a specified music genre to permit the data sending device 2 to start the above-mentioned genre-based sending program to sequentially send the music data of the specified genre to the data receiving device 4.

[0079] The controller 15 of the data sending device 2 on reception of the genre designation information refers at step S2 to the genre designation information of the request information to control the data retrieving processing unit 13 to sequentially retrieve and read out the music data in the specified genre from the hard disc array 12. In this case, the read-out musical data contains not only the new musical number data but also other music data.

[0080] At the next step S22, the controller 15 performs control to send the read-out musical data sequentially to the data receiving device 4. It should be noted that, when sending the new musical number data, a new musical number flag is set in the header of each data packet before sending the data.

[0081] The musical data sent from the data sending device 2 is received at step S23 by the data relaying device 5 and thence sent to the portable terminal device 6 under control by the controller 29 of the data relaying device 5.

[0082] The portable terminal device 6 on reception of the musical data from the data relaying device 5 at step S24 detects the new musical number flag of the header of the packet of each data packet shown in Fig.4 to check whether or not the data is the new musical number data (step S25). If the result of check at step S25 is YES, that is if the data is found to be the new musical number data, the flow moves to step S26 and, if otherwise, the flow moves to step S27.

[0083] The controller 42 at step S26 sends the new musical number data to the hard disc drive 32 to control the hard disc drive 32 to record the data on the hard disc in the hard disc drive 32.

[0084] The controller 42 performs control at step S27 to send the new musical number data or other musical data to the data expanding unit 38 to expand the data to sequentially reproduce the data. Thus, in the portable terminal device 6, the musical data of the genre specified by the user is sequentially reproduced, while only the new musical number data is automatically recorded on the hard disc.

[0085] At the next step S28, the controller 42 is in a state of waiting for an input indicating whether the payment should be made for each new musical number data recorded on the hard disc of the hard disc drive 32. If the result of check at step S28 is YES, that is if an input indicates that payment should be made, the reproducing state is switched to permit the new musical number data to be reproduced with the same high quality as that of the other music data to execute the processing of step S29. If the result of check at step S28 is NO, that is if an input indicates that payment is not made, the reproducing state is terminated, on the assumption that the user is not willing to reproduce data with high sound quality.

[0086] The controller 15 of the data sending device 2,which has received this request information, controls the accounting processing unit 14 at step S30 to make preset payment for the specified new musical number data.

[0087] After completion of the sending of the request information, the controller 42 of the portable terminal device 6 performs control at step S31 to set an accounting flag indicating the end of accounting for the musical data stored in the hard disc of the hard disc drive 32. This processing is performed by appending a flag to the leading end of the data, rewriting file allocation table (FAT) data or directory data of the hard disc or by providing the controller 42 with a table for data names of the music data stored in the hard disc and by setting a pointer in this table, as shown in Fig.7.

[0088] It is also possible to provide a new step between the step S30 and the step S31, to send data indicating the end of the accounting from the data sending device 2 to the portable terminal device 6 when the accounting at step S30 comes to a close and to execute

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the processing of step S31 by the portable terminal device 6 detecting this data.

[0089] By the above processing, an accounting flag is set on only those of the new musical number data recorded in the hard disc of the hard disc drive 32 for which the payment has been made.

[0090] In the above description, it is assumed that the data sending device 2 has started the genre-based sending program by the portable terminal device 6 sending the genre-based designation information. However, similar processing may be used when the data sending device 2 starts the new musical number data sending program by the portable terminal device 6 sending the above-mentioned new musical number request information. It this case, it suffices if the controller 15 of the data sending device 2 having received the new musical number request information retrieves the new musical number identifier to sequentially retrieve and read out new musical number data from the hard disc array 12.

[0091] If the controller 15 also receives the genre designation information along with the new musical number request information, it suffices if the data retrieving processing unit 13 is controlled at step S21 to sequentially retrieve and read out new musical number data of the genre specified by the user. If the data sending device 2 executes this new musical number data sending program, the processing of step S25 for checking on the side of the portable terminal device 6 if the data is the new musical number data based on the new musical number flag is unnecessary.

[0092] The playback processing for reproducing the acquired new musical number data for the case of reproducing new musical number data recorded on the hard disc of the hard disc drive 32 on the present portable terminal device 6 is explained with reference to the flowchart shown in Fig.6. In this case, the portable terminal device 6 is taken out of the data relaying device 5 and a headphone 44 is connected to the terminal 41a. This allows the user to hear the music of the new musical number data corresponding to the acquired new musical number data as the user carries the portable terminal device 6. The playback processing for new musical number data by the portable terminal device 6 is explained with reference to the flowchart shown in Fig.9.

[0093] At step S41 at the time of transfer to the new musical number data reproducing mode, the controller 42 of the portable terminal device 6 is in a state of waiting for a playback request for new musical number data. An actuation input signal, specifying the playback request, is kept at this step S41 until the actuation input signal specifying the playback request is supplied from the actuating input unit 35, with the actuation input signal transferring to step S42 when a playback request is issued. Specifically, at step S41, all data names of the new musical number data stored on the hard disc are displayed on the display unit 36 and the user then selects and decides one or more of the new musical number data desired to be reproduced by the user acting on one of the actuating buttons 35a to 35d of the actuating input unit 35.

[0094] At step S42, the controller 42 checks whether or not the accounting flag shown in Fig.7 has been set on new musical number data requested to be reproduced. At step S43, the new musical number data found at step S42 to be that for which the accounting flag is set (YES) is processed before the flow moves to step S45. The new musical number data found at step S42 to be that for which no accounting flag has been set (NO) is processed at step S44 before the flow moves to step S45.

[0095] At step S43, the controller 42 switches the playback state of the portable terminal device 6 to a high quality playback mode. Conversely, at step S44, the controller 42 switches the playback state of the portable terminal device 6 to a low quality playback mode. Examples of the reproducing processing of the low quality reproducing mode include executing data expansion at a lower data expansion rate than that used for expansion processing for the high quality reproducing mode, executing monaural reproduction if the new musical number data is stereo musical data or limiting the reproducing time such as reproducing only one chorus of the new musical number data.

[0096] At step S45, the controller 42 controls the data expanding unit 38 so that the new musical number data will be reproduced in accordance with the playback mode as set or with the reproducing state. The data sending/receiving system 1 then reproduces the new musical number data recorded on the hard disc of the hard disc drive 32 in such a manner that high quality reproduction is made as other musical data if the musical data as new musical number data with the accounting flag set is reproduced, while reproduction at a lower sound quality than in reproducing other musical data as at step S44 is made by way of a sample-wise reproduction if the musical data as new musical number data devoid of the accounting flag set is reproduced.

[0097] At the next step, the end waiting state is set in order to wait for termination of the reproducing operation. Thus, control dwells at this step S46 until the reproducing processing on all designated new musical number data comes to a close and, if the data reproducing operation comes to a close, control reverts to step s41 to repeat the processing from step S41 to step S46.

[0098] That is, if the new musical number data stored on the hard disc of the hard disc drive 32 is to be reproduced with the present data sending/receiving system 1, and the new musical number data to be reproduced is the new musical number data with the accounting flag set, high quality reproduction is executed as in the case of other musical data. If the new musical number data reproduced is that devoid of the accounting flag as set, sample-wise reproduction with a lower sound quality than in reproducing other musical data is executed. Thus, new musical number data for which payment has not been made can be heard repeatedly for trial sake.

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If there is any musical number data that has suited to the liking of the user as a result of tentative hearing, the corresponding new musical number data that can be reproduced with high sound quality similarly to other musical data can be acquired by the processing explained with reference to Fig.5.

[0099] In the above-described embodiment, the portable terminal device 6 and the data sending device 2 are interconnected via data relaying device 5. It is however possible to interconnect a modem 46 accessible to the communication network 3 to the I/F 37 shown in Fig. 3 via connection terminal 37a of the portable terminal device 6 to interconnect the portable terminal device 6 and the data sending device 2 without interposition of the data relaying device 5, as shown in Fig.10. In this case, it is also possible to interconnect a keyboard 45 or a display 47 to the connection terminal 37a for convenience in the inputting or display operations.

[0100] In the above-described embodiment, there is shown a data relaying device interconnecting a sole portable terminal device 6 with the data sending device 2. The present invention is, however, not limited to this specified constitution. For example, a data relaying device 50 capable of interconnecting plural portable terminal devices 6, as shown in Fig.11. Specifically, the data relaying device 50 includes plural mounting portions 7 for connecting to the portable terminal devices 6 on a base block of the device 50 and a corresponding plural number of actuating buttons 25a and display units 26. That is, with the present data relaying devices 50, the blocks 22 to 30 making up the data relaying device 50 are provided internally so that a number of users can acquire new musical number data or musical data at a time.

[0101] In the above-described embodiment, musical data for a new musical number that is on the market only for a pre-set period since it was first put on the market, such as for one month. The present invention is, however, not limited to this and any musical data not received by the user as yet, that is musical data that is new musical number data for the user, may be defined as new musical number data.

[0102] In this case, it suffices if the index information of data stored in the hard disc drive 32 of the current portable terminal device 6 is sent along with the above-mentioned request data to the data sending device 2 in order for the data sending device 2 to check if the information is the new information to permit only musical data not stored in the hard disc drive 32 of the portable terminal device 6 to be sent to the portable terminal device 6. It is also possible for the portable terminal device 6 to compare the data stored in the hard disc drive 32 to the data sent from the data sending device 2 in order to record only musical data not stored in the hard disc drive 32.

Claims

1. A data sending/receiving apparatus comprising:

   a first storage unit holding plural data on memory;

   a retrieval unit for retrieving the data stored in said first storage unit;

   a first sending/receiving unit for sending data retrieved by said retrieval unit, said first sending/receiving unit receiving the request information sent from a user and supplying the received request information to said retrieval unit; and

   a second sending/receiving unit for receiving the data sent from said first sending/receiving unit and for sending the request information from the user, said second sending/receiving unit having a decision unit for checking whether or not data sent from said first sending/receiving unit is data newly stored in said first storage unit and a second storage unit for storing data sent from said first sending/receiving unit if the results of check by said check unit indicates that the data is data stored in said first storage unit.

2. The data sending/receiving apparatus according to claim 1 wherein said second sending/receiving unit further includes a reproducing unit and wherein, if the results of check by said decision unit indicates data other than data newly stored in said first storage unit, said second sending/receiving unit reproduces the data sent from the first sending/receiving unit by said reproducing unit.

3. The data sending/receiving apparatus according to claim 1 or 2 wherein said first sending/receiving unit when sending data retrieved by said retrieval unit appends supplementary data indicating that the data is data newly stored in said first storage unit if data sent is the data newly stored in said first storage unit.

4. The data sending/receiving apparatus according to claim 3 wherein said decision unit checks whether or not data sent from said first storage unit is data newly stored in said first storage unit.

5. The data sending/receiving apparatus according to any one of the preceding claims, wherein said second sending/receiving unit generates the request information form the user inclusive of data specifying the user's intention to make payment to send the generated information to said first sending/re-

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ceiving unit.

6. The data sending/receiving apparatus according to claim 5 wherein said first sending/receiving unit switches the sending mode to said second sending/receiving unit of data retrieved by said retrieval unit based on data specifying the user's intention to make payment sent from the second sending/receiving unit.

7. The data sending/receiving apparatus according to claim 6 wherein said first sending/receiving unit switches the sending mode to the second sending/receiving unit based on data specifying the user's intention to make payment sent from the second sending/receiving unit if data retrieved by said retrieval unit is data newly stored in said first sending/receiving unit.

8. The data sending/receiving apparatus according to claim 7 wherein said first sending/receiving unit sends to said second sending/receiving unit data newly stored in said first sending/receiving unit with the same data quality as that in sending other data stored in said first storage unit if data specifying the user's intention to make payments for the request information from the user sent from the second sending/receiving unit indicates that the user is willing to make the payments.

9. The data sending/receiving apparatus according to claim 8 wherein said first sending/receiving unit sends to said second sending/receiving unit data newly stored in said first sending/receiving unit with the data quality lower than that in sending other data stored in said first storage unit if data specifying the user's intention to make payments for the request information from the user sent from the second sending/receiving unit indicates that the user is not willing to make the payments.

10. The data sending/receiving apparatus according to any one of the preceding claims, wherein said second sending/receiving unit generates the request information from the user inclusive of the genre designation information to send the generated information to said first sending/receiving unit.

11. The data sending/receiving apparatus according to claim 10 wherein said second sending/receiving unit when reproducing data stored in said second storage unit reproduces the data in the same playback state as that for reproducing data other than the data newly stored in said first storage unit if the user is willing to make the payment.

12. The data sending/receiving apparatus according to claim 11 wherein said second sending/receiving unit when reproducing data stored in said second storage unit sends the information concerning the payment to said first sending/receiving unit if the user is willing to make the payment.

13. The data sending/receiving apparatus according to claim 12 wherein said first sending/receiving unit performs accounting based on the accounting information sent from said second sending/receiving unit.

14. The data sending/receiving apparatus according to claim 11 wherein said first sending/receiving unit sends to said second sending/receiving unit data specifying that the accounting has come toa close and appends accounting data specifying that effect to data for playback stored in the second storage unit based on data specifying that the accounting has come to a close.

15. The data sending/receiving apparatus according to claim 14 wherein said second sending/receiving unit switches the reproducing state of data stored in said second storage unit based on said accounting data.

16. The data sending/receiving apparatus according to claim 11 wherein said second sending/receiving unit discontinues the reproducing state if, when reproducing data stored in said second storage unit, the user has no intention to make payments.

17. The data sending/receiving apparatus according to claim 10 wherein said first sending/receiving unit sends to the retrieving unit the request information from the user containing the genre designation information sent from the second sending/receiving unit, and wherein said retrieval unit retrieves data stored in said first storage unit based on the request information from the user containing the genre designation information to send the retrieved data to the second sending/receiving unit.

18. A data receiving apparatus comprising:

a sending/receiving unit for receiving data sent from a host side device and for sending the request information from the user to said host side device;

a storage unit for storing received data sent by said sending/receiving unit; and

a controller for checking whether or not the sent data is data newly stored in said host side device, said controller causing the sent data to be stored in said storage unit if the results of check indicate that the sent data is data newly stored

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in said host side device.

19. The data receiving apparatus according to claim 18 further comprising:

a reproducing unit;

said controller causing the sent data to be reproduced by said reproducing unit if the results of check indicate that the sent data is data other than data newly stored in said host side device.

20. The data receiving apparatus according to claim 19 wherein said controller further includes a check unit for checking whether or not the sent data is data newly stored in said host side device.

21. The data receiving apparatus according to claim 20 wherein said controller discriminates, based on the supplementary data appended to the sent data for indicating that the data is data newly stored in the host side device, whether or not the sent data is data newly stored in the host side device.

22. The data receiving apparatus according to any one of claims 18 to 21, wherein said sending/receiving unit generates the request information from the user containing data specifying the user's intention to make payments to send the generated data to said host side device.

23. The data receiving apparatus according to any one of claims 18 to 22, wherein said sending/receiving unit generates the request information from the user containing the genre designation information to send the generated information to said host side device.

24. The data receiving apparatus according to claim 23 wherein if, when data stored in said storage unit is to be reproduced, the user has the intention to make payments, the data is reproduced in a reproducing state similar to that for reproducing data other than said data newly stored in said host side device.

25. The data receiving apparatus according to claim 24 wherein if, when data stored in said storage unit is to be reproduced, the user has the intention to make payments, the accounting information is sent from said sending/receiving unit to said host side device.

26. The data receiving apparatus according to claim 25 wherein, after accounting comes to a close on the basis of the accounting information, accounting data specifying that the accounting has come to a close is appended to data for playback stored in said storage unit.

27. The data receiving apparatus according to claim 26 wherein the playback state of data stored in said storage unit is switched based on said accounting data.

28. The data receiving apparatus according to claim 24 wherein if, when reproducing data stored in said storage unit, the user has no intention to make payments, the reproducing state is discontinued.

29. A data sending/receiving method comprising the steps of:

retrieving plural data stored in a first storage unit based on the request information from a user sent to a host side device;

sending the retrieved data to a terminal side device;

checking whether or not the sent data is data newly stored in said first storage unit; and

storing the sent data in a second storage unit of said terminal side device if the results of discrimination indicate that the sent data is data newly stored in said first storage unit.

30. The data sending/receiving method according to claim 29 wherein, if the results of discrimination indicate that the sent data is data other than data newly stored in said first storage unit, the sent data is reproduced by said terminal side device.

31. The data sending/receiving method according to claim 29 wherein if, when the retrieved data is sent, the sent data is data newly stored in said first storage unit, supplementary data specifying that the sent data is data newly stored in said first storage unit is appended to the sent data and resulting data is sent.

32. The data sending/receiving method according to claim 31 wherein the sent data is checked on the basis of the supplementary data as to whether the sent data is data newly stored in said first storage unit.

33. The data sending/receiving method according to claim 29 wherein the request information from the user containing data specifying the user's intention to make payments is generated and sent from said terminal side device to said host side device.

34. The data sending/receiving method according to claim 33 wherein the sending mode of the retrieved data is switched on the basis of data specifying the user's intention to make payments for the request

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information sent from the portable terminal device.

35. The data sending/receiving method according to claim 33 wherein the sending mode of the retrieved data is switched on the basis of data sent from the terminal side device specifying the user's intention to make payments for the request information in case the retrieved data is data newly stored in said first storage unit.

36. The data sending/receiving method according to claim 35 wherein, if the data sent from the terminal side device specifying the user's intention to make payments for the request information sent from the terminal side device specifies that the user has the intention of making payments, data newly stored in said first storage unit is sent to said terminal side device with the same data quality as that of other data stored in said first storage unit and sent.

37. The data sending/receiving method according to claim 36 wherein, if the data sent from the terminal side device specifying the user's intention to make payments for the request information sent from the terminal side device specifies that the user has no intention of making payments, data newly stored in said first storage unit is sent to said terminal side device with the data quality inferior to that of other data stored in said first storage unit and sent.

38. The data sending/receiving method according to claim 29 wherein the request information from the user containing the genre designation information is generated and sent to said host side device.

39. The data sending/receiving method according to claim 38 wherein if, when data stored in said storage unit is to be reproduced, the user has the intention to make payments, the data is reproduced in a reproducing state similar to that in reproducing data other than said data newly stored in said host side device.

40. The data receiving method according to claim 39 wherein if, when data stored in said storage unit is to be reproduced, the user has the intention to make payments, the accounting information is sent to said host side device.

41. The data sending/receiving method according to claim 40 wherein accounting is executed on the basis of the accounting information sent from the terminal side device.

42. The data sending/receiving method according to claim 41 wherein data specifying that the accounting has come to a close is sent to said terminal side device and wherein said terminal side device appends accounting data specifying that the accounting has come to a close to data for playback stored in said second storage unit based on data specifying that the accounting has come to a close.

43. The data sending/receiving method according to claim 42 wherein the reproducing state of data stored in said second storage unit is switched based on said accounting data.

44. The data receiving apparatus according to claim 39 wherein if, when reproducing data stored in said second storage unit, the user has no intention to make payments, the reproducing state is discontinued.

45. The data receiving apparatus according to claim 38 wherein data stored in the first storage unit is retrieved on the basis of the request information from the user containing the genre designation information sent from the terminal side device and wherein the retrieved data is sent to said terminal side device.

46. A data sending apparatus comprising:

a storage unit having plural data stored therein;

a retrieval unit for retrieving data stored in said storage unit based on the request information from the user containing data specifying the user's intention to make payments sent from a terminal side device; and

a sending/receiving unit for sending the data retrieved by said retrieval unit, said sending/receiving unit receiving the request information sent from the user to send the received information to said retrieval unit, said sending/receiving unit switching the sending mode to said terminal side device of data retrieved by said retrieval unit based on data specifying the user's intention to make payments for the request information from the user.

47. The data sending apparatus according to claim 46 wherein said sending/receiving unit switches the sending mode to said terminal side device based on data specifying the user's intention to make payments for the request information from the user sent from the terminal side device if the data retrieved by said retrieval unit is data newly stored in said storage unit.

48. The data sending apparatus according to claim 47 wherein, if the data sent from the terminal side device specifying the user's intention to make payments for the request information sent from the ter-

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minal side device specifies that the user has the intention of making payments, data newly stored in said storage unit is sent to said terminal side device with the same data quality as that of other data stored in said storage unit and sent.

49. The data sending apparatus according to claim 48 wherein, if the data sent from the terminal side device specifying the user's intention to make payments for the request information sent from the terminal side device specifies that the user has no intention of making payments, data newly stored in said storage unit is sent to said terminal side device with the data quality inferior to that of other data stored in said storage unit and sent.

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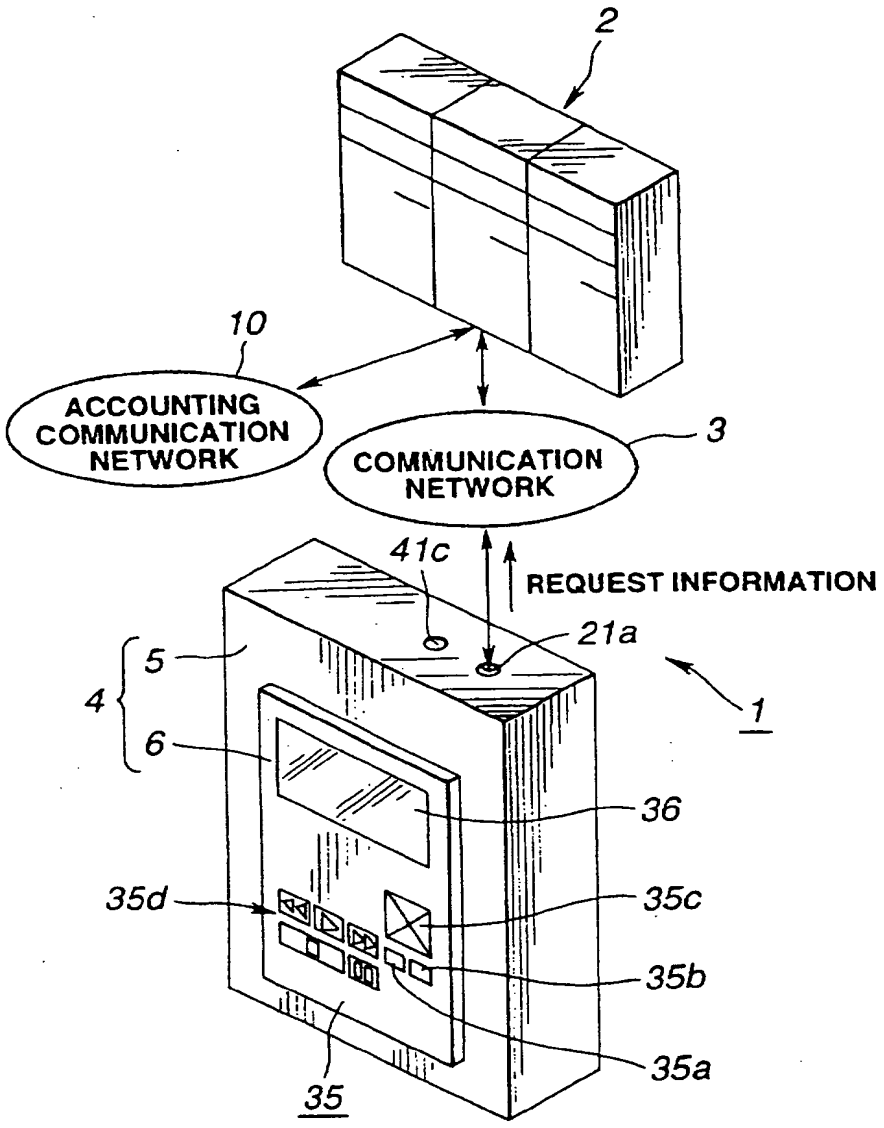

FIG.1

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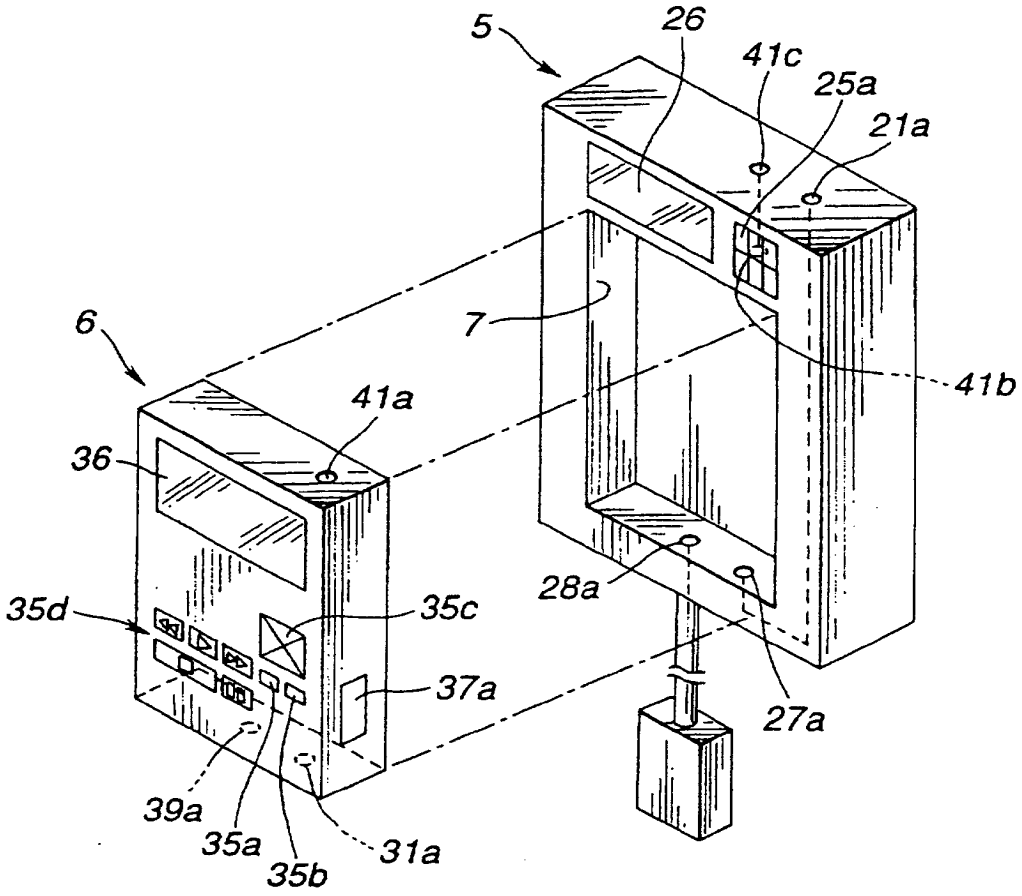

FIG.2

BNSDOCID: <EP_____0918408A2_I_>

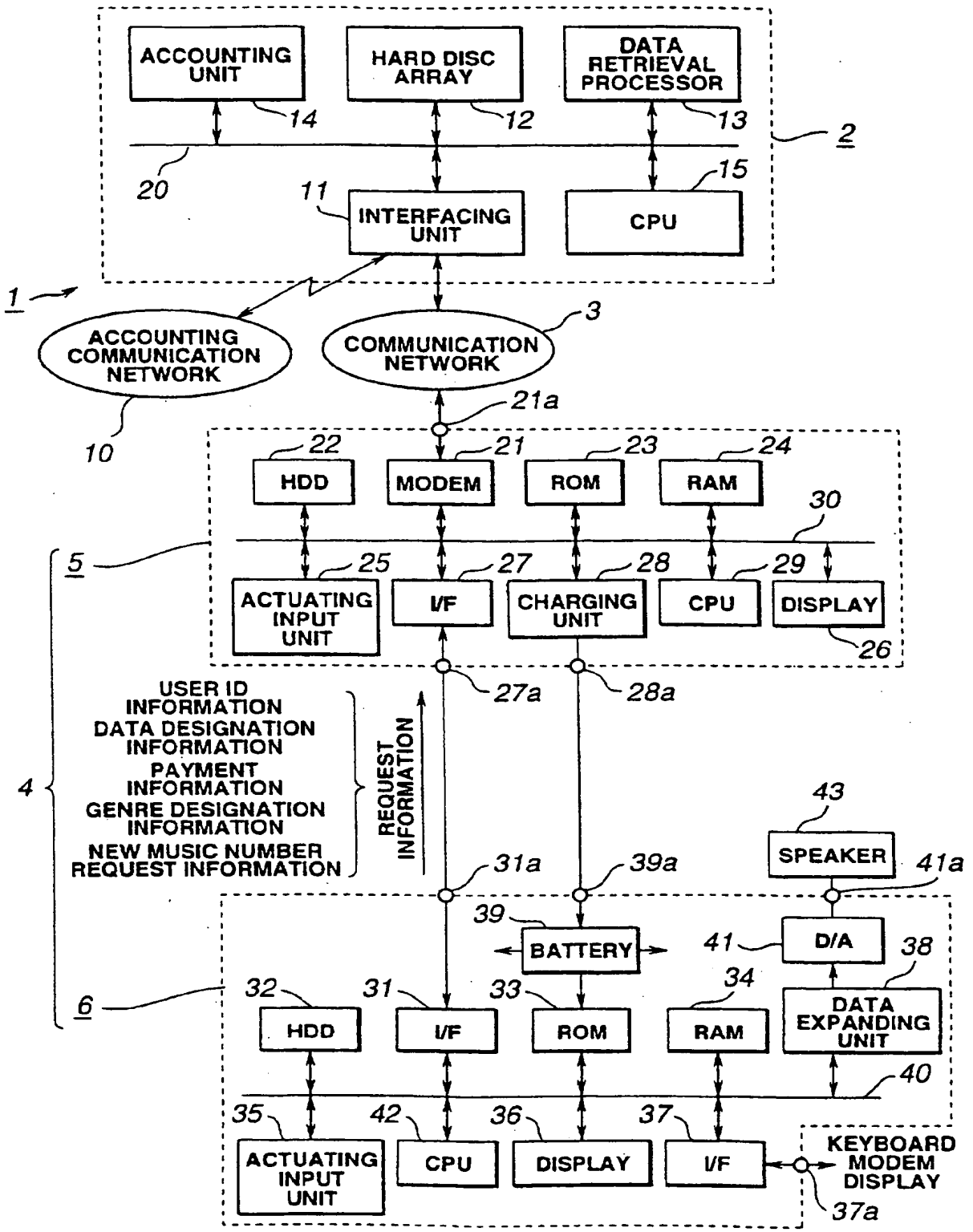

FIG.3

BNSDOCID: <EP_____0918408A2_I_>

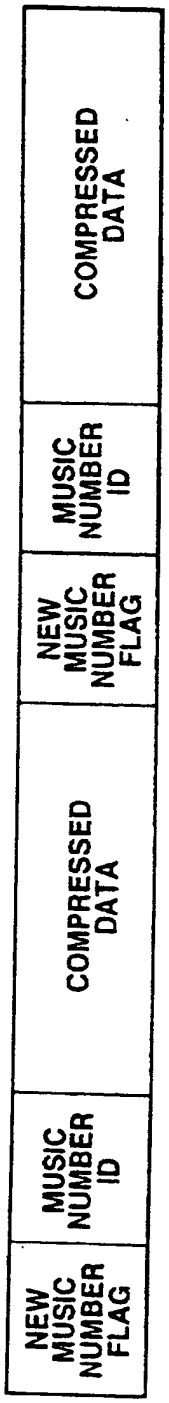

FIG.4

BNSDOCID: <EP_____0918408A2_I_>

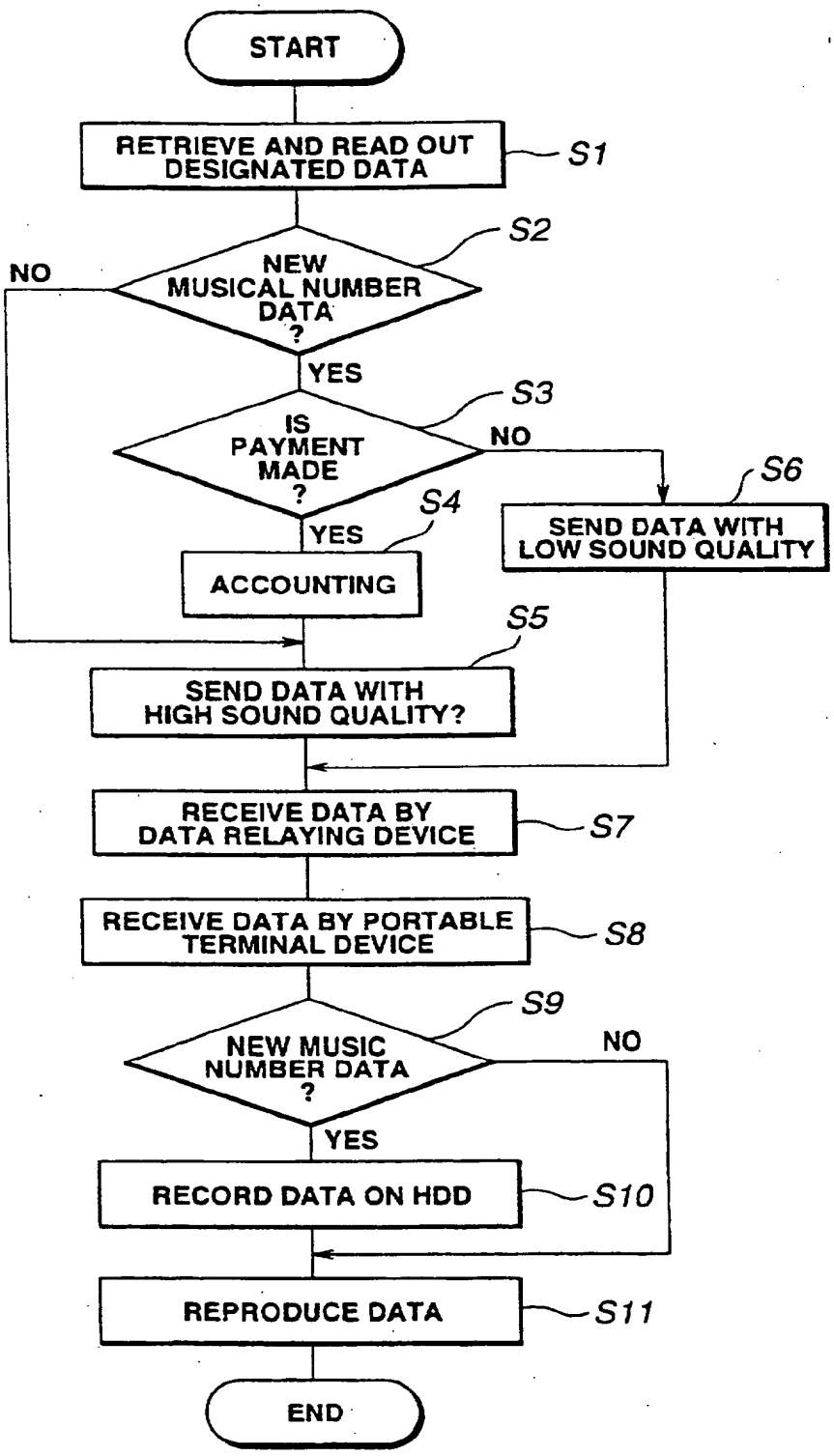

FIG.5

BNSDOCID: <EP_____0918408A2_I_>

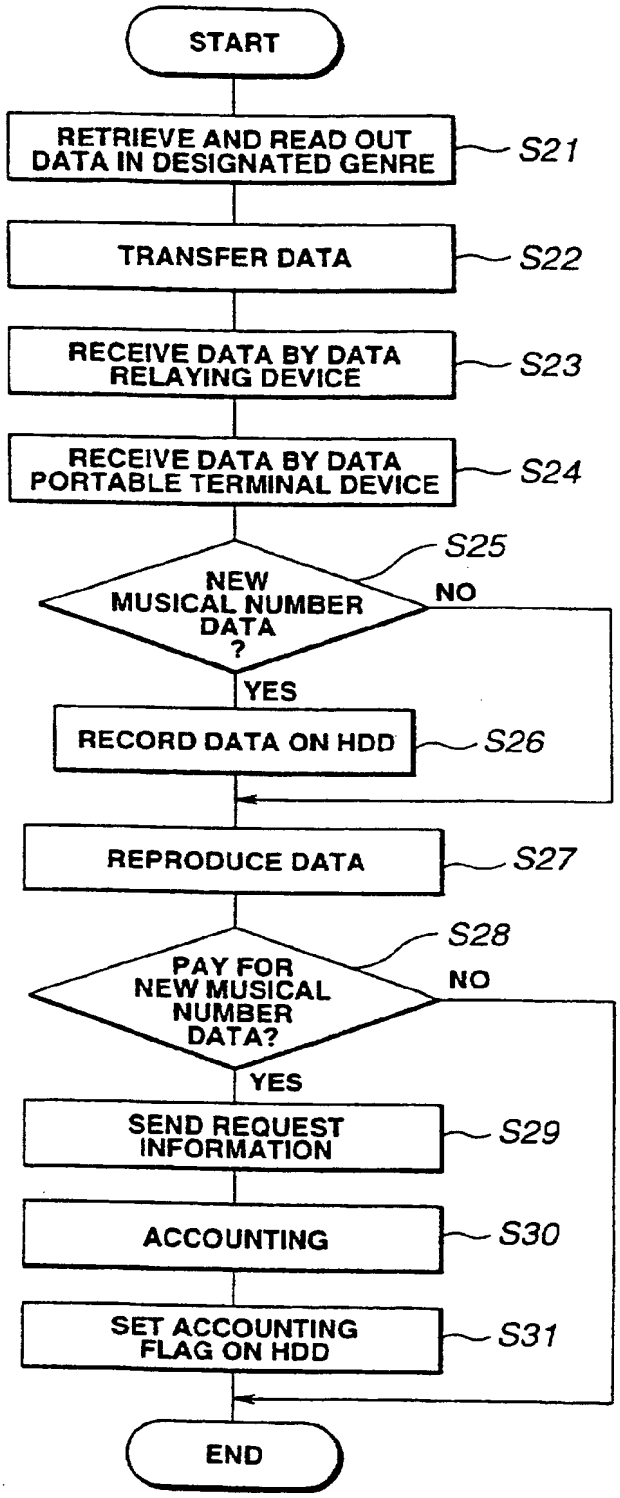

FIG.6

BNSDOCID: <EP_____0918408A2_I_>

ACCOUNTING FLAG	DATA

FIG.7

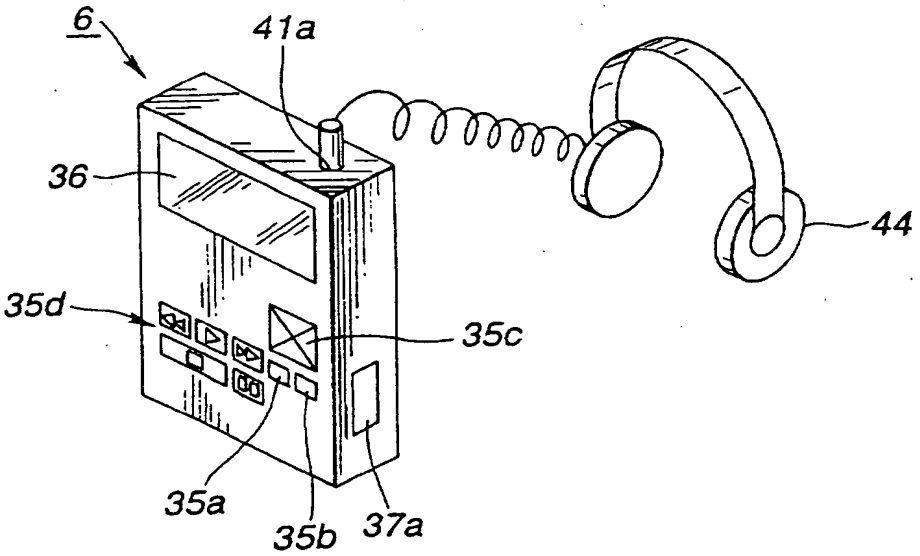

FIG.8

BNSDOCID: <EP_____0918408A2_I_>

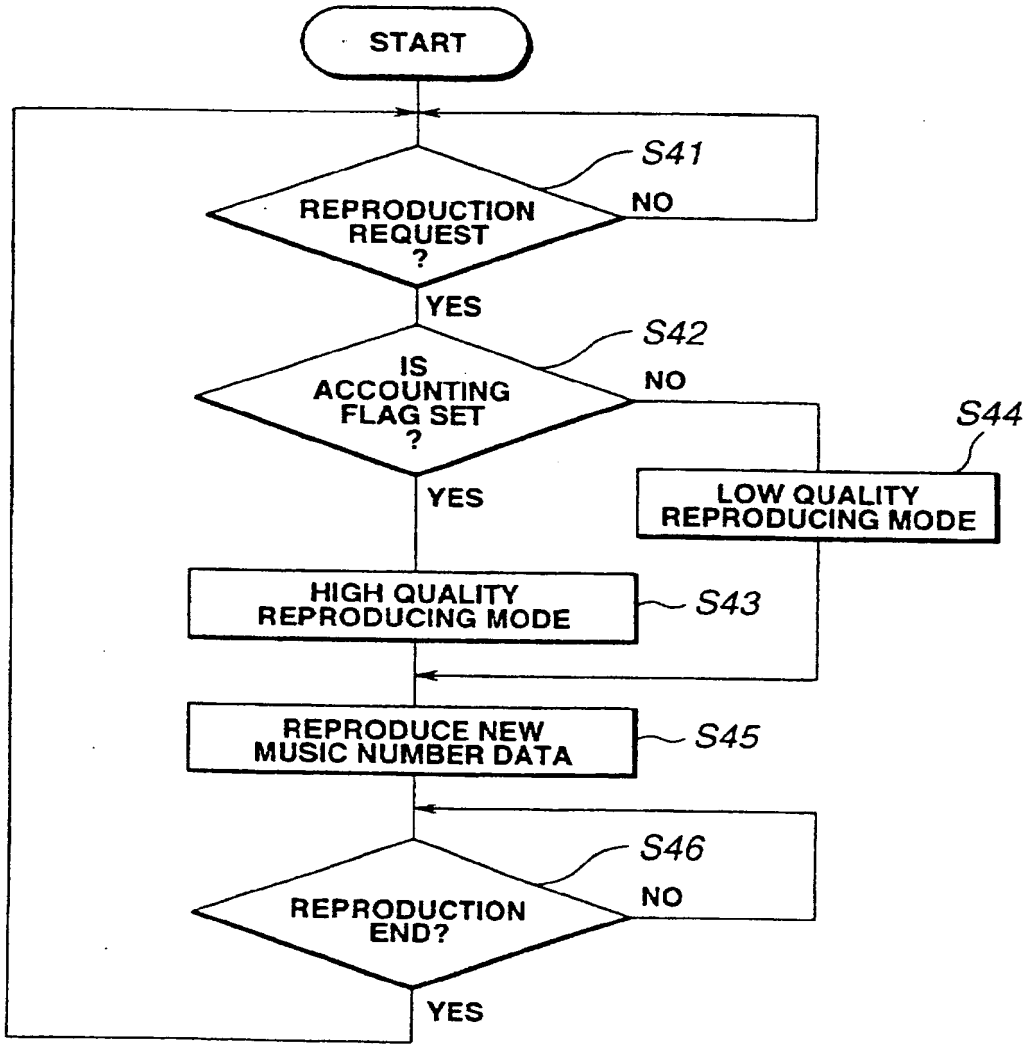

FIG.9

BNSDOCID: <EP_____0918408A2_I_>

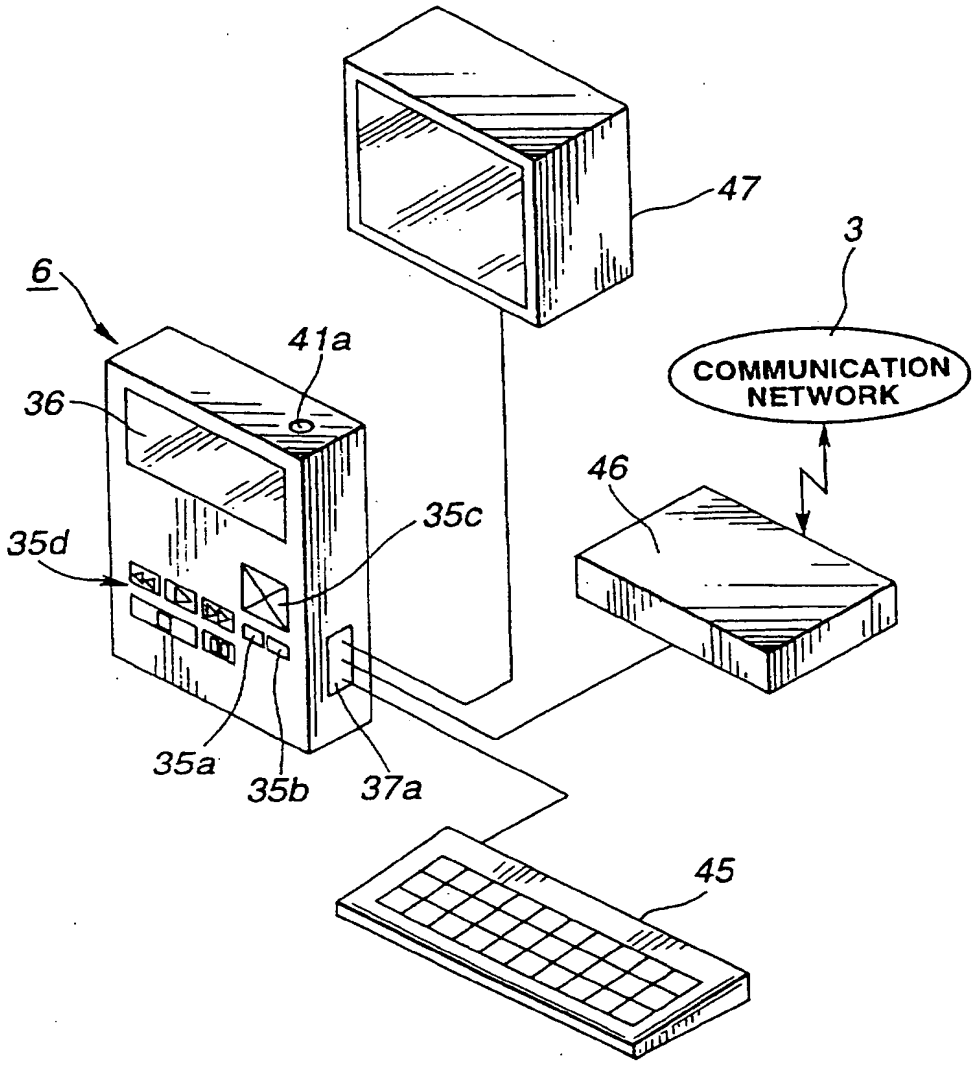

FIG.10

BNSDOCID: <EP_____0918408A2_I_>

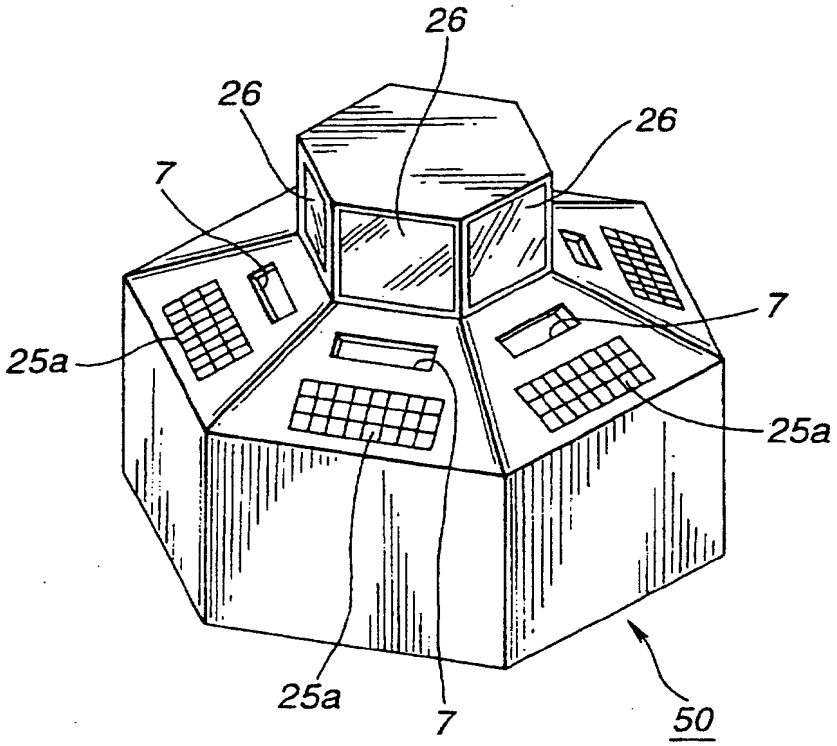

FIG.11

ORIGINAL
NO MARGINALIA

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